



**LUNDS UNIVERSITET**  
Lunds Tekniska Högskola

*Course syllabus*

# **Fuktsäkerhetsprojektering av byggnader** **Moisture Safety Design of Buildings**

**VBFN15, 7,5 credits, A (Second Cycle)**

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED V

**Date of Decision:** 2023-03-21

## **General Information**

**Main field:** Energy-efficient and Environmental Buildings.

**Compulsory for:** MEMB1

**Language of instruction:** The course will be given in English

## **Aim**

To give more advanced knowledge of moisture safe design in building components and buildings; the factors which influence the moisture safety and how a satisfying indoor environment should be achieved.

To give the student knowledge to create buildings which fulfill demands concerning moisture safety with consideration of low energy use, comfort and healthy indoor environment.

## **Learning outcomes**

*Knowledge and understanding*

For a passing grade the student must

- Understand how a building is functioning as a system.
- Quantitatively be able to judge the moisture safety for a building.
- Identify and analyse all parts in a moisture balance and compare with parts in a energy balance.
- Explain how all the components in a moisture balance influences the moisture safety for the building and its building components.
- Be able to use hygrothermal calculation tools when designing building components and building envelope.

- Measure basic moisture-related climate parameters, evaluate results from measurements and suggest relevant measures.
- Be able to identify critical parts in sustainable/low-energy buildings which should be analysed from an indoor climate quality point of view.

#### *Competences and skills*

For a passing grade the student must

- Be able to perform and analyse results from transient calculations of coupled heat- and moisture flux in building elements and structures and evaluate the moisture safety from the results.
- Understand consequences of air leakage on moisture conditions in the building envelope.
- Show ability for teamwork and cooperation in groups,
- Be able to oral and in written, in dialog with other groups, present and discuss results and conclusions.
- Be able to analyse how different combinations of materials and components will affect the moisture conditions.

#### *Judgement and approach*

For a passing grade the student must

- Have ability to identify potential risk constructions concerning moisture safety
- Realize the need for further knowledge to develop his/her competence.

## **Contents**

This course will start with an overview of the goals for the master's programme with a global perspective on environmental issues, energy needs and natural resources, directive and goals, policies, incentives and moisture design process (joint with the course AEBN05; Energy Use and Thermal Comfort in Buildings, 1st week).

Building physical design of building elements, connections entry unit and other details to create moisture safe buildings. Information about methodology for moisture design, critical moisture levels and healthy buildings.

Manual and numerical hygrothermal calculations including moisture criteria, critical moisture state, impact of moisture on energy consumption, moisture transport, moisture balance, surface condensation, moisture convection and moisture diffusion.

Project exercise is an element in the course where moisture safety design, including hygrothermal calculations, are dealt with.

## **Examination details**

**Grading scale:** TH - (U,3,4,5) - (Fail, Three, Four, Five)

**Assessment:** The final grade is to 70% based on the written examination and to 30% on the performance related to the exercises and lectures.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

## **Parts**

**Code:** 0123. **Name:** Exercise.

**Credits:** 3. **Grading scale:** UG. **Assessment:** Examination based on written report according to given criteria.

**Contents:** Moisture design.

**Code:** 0223. **Name:** Written Examination.

**Credits:** 4,5. **Grading scale:** TH. **Assessment:** Examination based on the written examination. **Contents:**

Written examination of the whole course.

## **Admission**

**The number of participants is limited to:** No

**The course overlaps following course/s:** VBFF05

## **Reading list**

- Hagentoft C-E: Introduction to Building Physics. Studentlitteratur , 2005, ISBN: 978-91-440-1896-6.
- Abel E, Elmroth A: Buildings and Energy - a systematic approach, T6:2007. FORMAS, 2007, ISBN: 978-91-540-5997-3.
- Course literature will be available through an electronic course library via the course website.

## **Contact and other information**

**Course coordinator:** Vahid Nik, vahid.nik@byggtek.lth.se

**Course homepage:** <http://www.ebd.lth.se/master>